Article 34

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(70)

CLAIMS

1. A method of the thermal treatment of an aqueous fluid comprising carbonaceous material to be gasified, to yield a combustible gas, which method comprises the following steps:

i) feeding the aqueous fluid comprising carbonaceous material to be gasified to a reactor comprising a course of treatment;

ii) transferring heat to the carbonaceous material-comprising aqueous fluid in counterflow;

iii) the gasification of the carbonaceous material in the course of treatment at an elevated temperature in the presence of water, to yield a product stream comprising combustible gas and a carbonaceous material-depleted aqueous fluid; and

iv) cooling the product stream until the carbonaceous material-depleted aqueous fluid at least partially comprises a carbonaceous material-depleted aqueous fluid and the separation of the combustible gas from the carbonaceous material-depleted aqueous fluid.

2. A method according to claim 1, **characterized** in that the gasification in step iii) is carried out at a temperature and pressure equal to or higher than the critical temperature and pressure of water.

3. A method according to claim 2, **characterized** in that the gasification in step iii) is carried out at a temperature higher than 400°C, preferably higher than 500°C.

4. A method according to one of the preceding claims, **characterized** in that cooling of the product stream in step iv) is carried out by feeding it in counterflow to the aqueous fluid comprising carbonaceous material to be gasified.

5. A method according to one of the claims 1-3, **characterized** in that the carbonaceous material-depleted aqueous fluid is heated, oxygen-comprising gas is intro-

AMENDED SHEET

duced into the heated fluid, oxygen is reacted with the carbonaceous material present in the depleted aqueous fluid producing heat, which heat is transferred to an aqueous fluid comprising carbonaceous material to be gasified.

6. A method according to one of the preceding claims, **characterized** in that a portion of the combustible gas formed is used to attain the elevated temperature described in step ii).

7. A method according to one of the preceding claims, **characterized** in that subsequent heating is effectuated by counterflow to the aqueous fluid comprising carbonaceous material to be gasified.

8. A method according to one of the preceding claims, **characterized** in that the heat supplied to the fluid comprising material to be gasified stems from an exothermal synthesis reaction.

9. A method according to claim 6 or 7, **characterized** in that the combustible gas is combusted in a combustion installation to yield electricity and heat.

10. A method according to one of the preceding claims, **characterized** in that the carbonaceous material to be gasified is biomass.

11. A method according to claim 10, **characterized** in that the biomass is selected from the group comprising semi-liquid manure and manure suspended in water.

12. An installation for the thermal treatment of an aqueous fluid comprising carbonaceous material to be gasified to yield a combustible gas and an aqueous fluid poor in carbonaceous material to be gasified comprising a high-pressure pump for feeding under high pressure the aqueous fluid comprising carbonaceous material to be gasified to an elongated tubular reactor having a first and a second end, wherein the first end is provided with an inlet for the aqueous fluid comprising carbonaceous material to be gasified, and the second end is provided with an outlet for a product stream comprising the combustible gas and the aqueous fluid poor in carbonaceous material, which reactor is provided in a chamber of an

incinerator, which chamber is separated from the lumen of the tubular reactor by means of a heat-conducting reactor wall defining a course of treatment, at the side of the outlet of the tubular reactor the incinerator is provided with a first inlet for oxygen-comprising gas and a second inlet for a fuel, and at the side of the inlet of the reactor the chamber is provided with an exhaust for combustion products, the arrangement of inlets and outlets providing for counterflow heat-exchange over the course of treatment and the exhaust of the reactor is connected to means for cooling the product stream and means for the separation of the combustible gas formed as a result of gasification, and carbonaceous material-depleted aqueous fluid.

13. An installation according to claim 12, **characterized** in that the installation comprises a heat exchanger conducting the carbonaceous material-depleted fluid coming from the tubular reactor in counterflow to the aqueous fluid comprising carbonaceous material to be gasified.

14. An installation according to claim 12 or 13, **characterized** in that the installation comprises a heat exchanger for conducting combustion products coming from the incinerator in counterflow to oxygen-comprising gas to be supplied to the first inlet.

15. An installation for the thermal treatment of an aqueous fluid comprising carbonaceous material to be gasified to yield a combustible gas and a carbonaceous material-depleted aqueous fluid to be gasified, which installation comprises a gasification reactor having a substantially elongated first chamber and a substantially elongated second chamber, the first chamber comprising an inlet opening for the thermal treatment of aqueous fluid comprising carbonaceous material to be gasified, the first chamber and the second chamber being separated by a heat-conducting wall, which heat-conducting wall defines a course of treatment along which, after separation of the combustible gas, the aqueous fluid comprising carbonaceous material to be gasified is conducted in counterflow to an

aqueous fluid which, as a result of thermal treatment, has become poor in carbonaceous material to be gasified and has been separated from combustible gas, the installation further comprises means for separating the combustible gas and the aqueous fluid which, as a result of thermal treatment, has become poor in carbonaceous material, as well as an exhaust for the combustible gas, further the second chamber is provided with an inlet opening for the supply of compressed oxygen-comprising gas via a pipe and by means of a pumping organ to the aqueous fluid which, as a result of thermal treatment, has become poor in carbonaceous material and which has separated from the combustible gas, and an outlet for a fluid which has been subjected to thermal treatment and oxidation.

16. An installation according to claim 15, **characterized** in that the means for separating the combustible gas and the aqueous fluid which, as a result of thermal treatment, has become poor in carbonaceous material, comprise a heat exchanger.

17. An installation according to claim 15 or 16, **characterized** in that the installation comprises means for the combustion of the combustible gas to yield electricity and heat.

18. An installation according to claim 17, **characterized** in that the installation further comprises a heat-conducting surface for transferring to at least one chamber heat released during combustion.

19. An installation according to claim 18, **characterized** in that the first chamber surrounds in the longitudinal direction substantially the second chamber and the heat-conducting surface surrounds in the longitudinal direction substantially the first chamber.